
Is the 5 minute shower an urban myth?

**Water efficiency: linking design,
technology and behaviour**

Ecobuild 2010

Cath Hassell

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Who are ech₂o and what do we do?

- We are environmental consultants specialising in sustainable water strategies and low carbon or renewable technologies
- We work in new build or existing buildings
- We work with occupants of the building to change their behaviour as well as identifying the best technological solutions
- Our clients include local authorities, housing associations, schools and colleges, water companies, architects, community groups, and householders



Behaviour change can reduce the load on the mains water supply without increasing the carbon load of the water supplied

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The carbon load of water



- CO₂ emissions from 1m³ of hot water are 7kgCO₂ or more.

- It takes 1.2 kWh of (mostly) electrical energy to supply and treat 1m³ of mains water.
- This results in 0.7 kg of CO₂ emissions per m³ of mains water used.
- Carbon emissions from the water supply industry are only 0.6% of total UK emissions but when we add domestic hot water use this figure rises to 6%.

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Why is this question important?

- Govt policy relies on the “average 5 minute shower” fact to calculate water use in new build homes under Part G and the CSH
- Any shower use over 5 minutes impacts on CO₂ emissions as well as water use

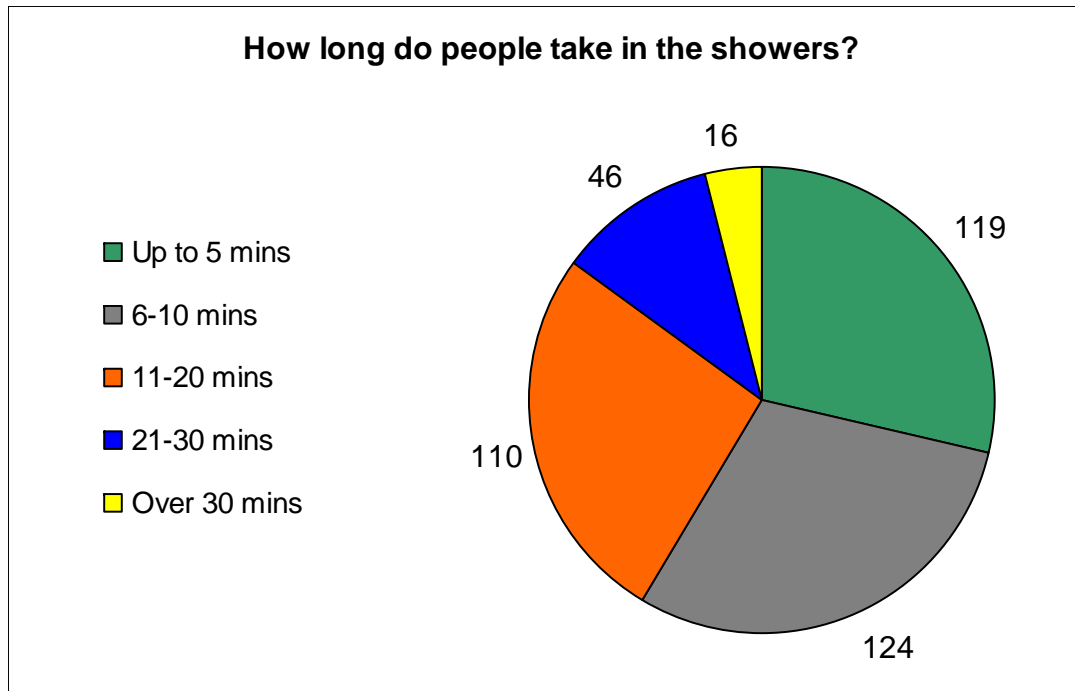
Increasing CO₂ emissions from longer showers (10 litre/min shower)

Duration of shower	Water use per day litres	Water use per year litres	CO ₂ emissions per year kgCO ₂	Extra CO ₂ load/ year between a 10 litre/min shower for 5 mins and kgCO ₂
2 mins	20	7,300	58.4	-
5 mins	50	18,250	146.0	-
10 mins	100	36,500	292.0	146 kgCO ₂
15 mins	150	54,750	438.0	292 kgCO ₂
30 mins	300	109,500	876.0	730 kgCO ₂



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Is the 5 minute shower an urban myth?



Download a report at www.ech2o.co.uk

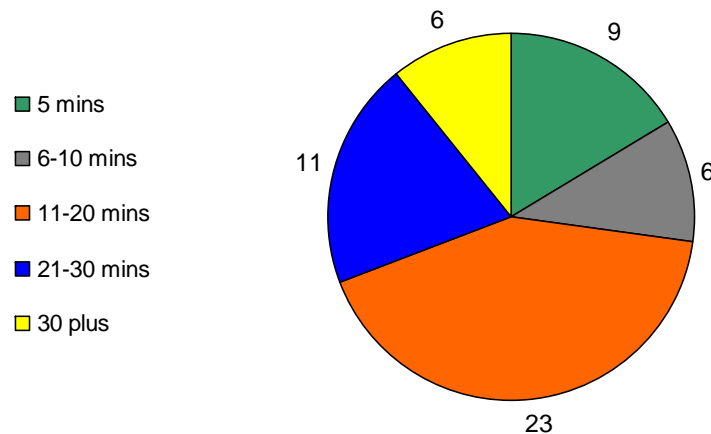
- A survey of 415 shower users from 649 people across 167 households from June 2008 through to Dec 2009
- 202 males and 213 females aged 5 - 85
- Average shower time was 13 minutes
- Waterwise research in summer 2009 showed an average shower time of 10 minutes



It looks like water shortages in the south east *are* being driven by the showering habits of adolescent girls



How adolescent girls shower



- Average water use is 150 litres per person per day. Individual use can reach 500 litres and more
- In our survey of 55 adolescent girls, 42% of them have a shower that lasts 11-20 minutes against a 27% average across all the groups.
- And in fact they came top in 21-30 minutes (20% v 11%) and over 30 minutes too (11% v 4%).

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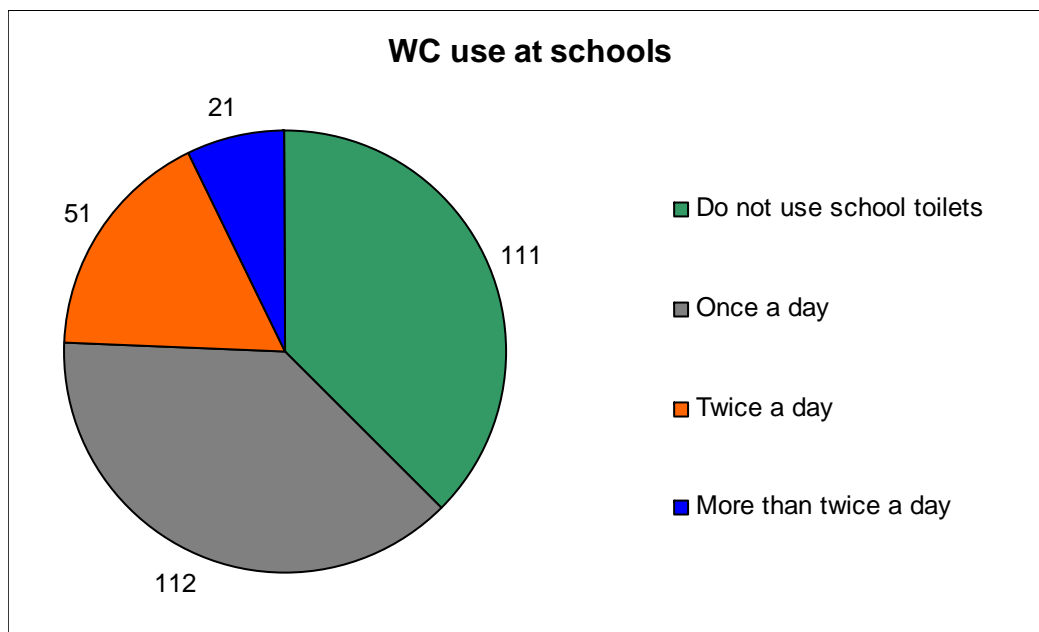
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How might other unexpected behaviour impact on water savings?

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WC use in school is less than we think



City Academy Hackney, by Studio E. Single toilets accessed directly off the corridor at suggestion of pupils during the consultation

- 295 school pupils aged 5 – 18
- Average visits to the toilet (WCs and urinals) is 1.0 per pupil
- Industry usually uses a figure of three visits per pupil when calculating savings from water efficiency measures



Urinal controls don't always save as much water as calculated



- Work in the hospitality sector using data loggers to demonstrate actual water savings from urinal controls showed a change in the pattern of use post controls but in some cases little overall savings
- Premises had reduced flow into urinals to a trickle to save water pre the smoking ban, but landlords wanted more water to flush post the ban
- Hygiene parameters were increased but so was water use

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What are the most effective ways to change behaviour?

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Saving Water in Crawley's Hospitality Sector

The Brewery Shades saves 157m³ of water every year from water efficiency measures installed under this project.



This project is run by ech₂o for Crawley Borough Council and funded by SEEDA.
To find out more visit: www.ech2o.co.uk



Education and information are key



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Saving water in the hospitality sector

The South East is Under Water Stress



- Water efficiency measures in 30 pubs and clubs in Crawley.
- Direct water savings of over 5000m³/year, resulting in 2,735 kg of CO₂ not emitted.
- Indirect savings unquantifiable, but expected to be significant.

Use Water Sparingly

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ENGLAND
DEVELOPMENT
AGENCY
Working for England's World Class Region

Medway
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'Saving water in the hospitality sector' www.ech2o.com



Save Water Save Money

This toilet has a Save-a flush bag fitted saving 1 litre of water with every flush

To get one free, contact your local water supplier

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- 11 schools in Hackney. A Thames Water project in conjunction with Hackney City Farm
- Worked with 2403 pupils and 120 teachers.
- 6,004m³ of water, 4.5 tonnes of CO₂ and £10,267 saved per year from technological solutions.
- 16,751 m³ of water and 175 tonnes of CO₂ saved per year from behaviour change.



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Go Carbon Neutral, Cranberry

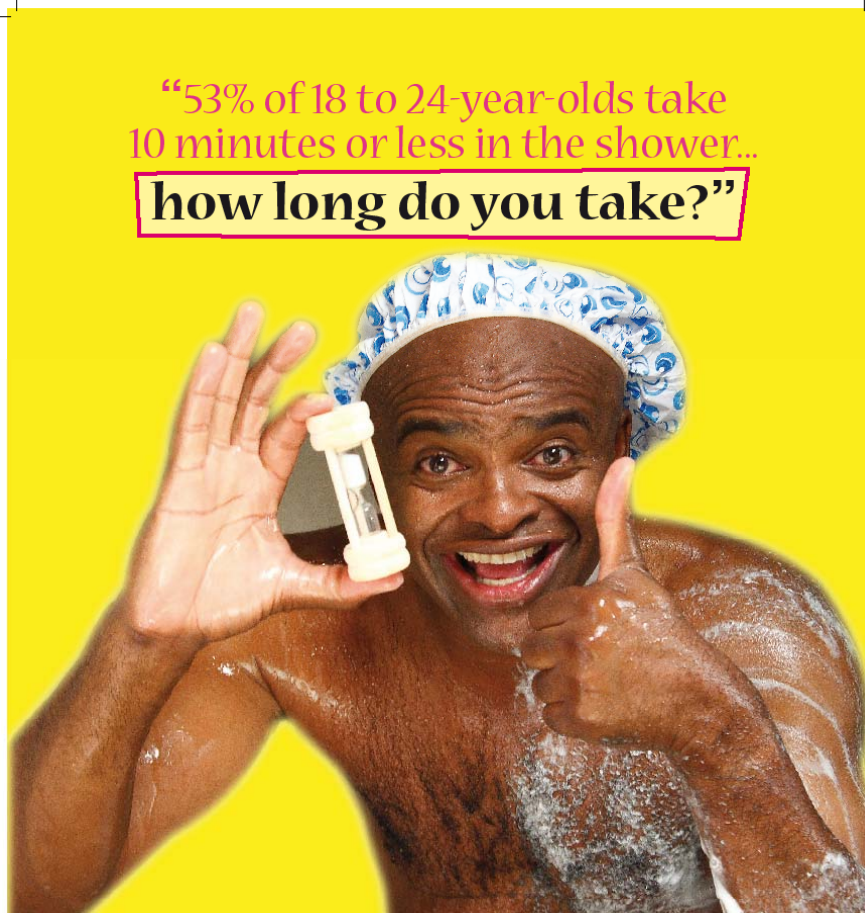


- Residents on Cranberry Estate were experiencing difficulty in paying their water bills
- Working with East Thames Housing Association ech₂o trained a group of residents to carry out water audits, implement low and zero cost water efficiency measures, and to explain the savings behaviour change could make to water bills
- Residents were paid by vouchers
- 100 flats audited. Greater uptake than if used outside contractors. Better quality of data collected. Message passed across more effectively.
- £40 per flat including training

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Appealing to the social norm



- Requires greater than 50% carrying out the desired behaviour to be effective.
- Therefore wouldn't work for adolescents but could for adults.
- Would rewards work as a strategy for adolescents?
- What about a story line in Hollyoaks or Skins?

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Saving water from shorter showers

	Water use/day @	Water use/day @	Water use/day @	Water saving/year
Duration of shower	5 litres/min	10 litres/min	20 litres/min	A 10 litre/min shower for 5 mins
2 mins	10	20	40	-
5 mins	25	50	100	-
10 mins	50	100	200	SAVE 18,250 litres!
15 mins	75	150	300	SAVE 36,500 litres!
30 mins	150	300	600	SAVE 91,250 litres!



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**For water meters to most
successfully change behaviour are
they best sited inside or outside
buildings?**

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Meters should be installed inside buildings

- Allows building occupiers to monitor usage.
- Reduces number of estimated bills.
- Prevents the problem of large bills due to unknown leakage
- Puts onus of repairing underground leaks on customer supply pipes onto the water supplier and does not penalise individual householder.
- Collecting data from underground meters is not a match made in heaven.
- United Utilities current preference is for internal meters.



**Behaviour change around water
can save large amounts of water,
CO₂ and £.**

**Behaviour inertia around water
can continue to squander large
amounts of water, CO₂ and £.**

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Are confusing messages likely to lead to behaviour inertia?

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When is a shower water efficient?



- Can install 15 litres/minute showers under Part G and pass the water efficiency criteria!
- Under the BMA labelling scheme, a shower with this flow rate gets the lowest rating.
- Under the CERT scheme households are being sent flow regulators to reduce flow rates to less than 8 litres/minute.

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Do we only need to save water in the summer?

- Will seasonal tariffs spread the message that you only need to save water during the summer months? For example, Veolia water trial in Bishop Stortford. £1.44p/m³ from May to August, and £0.61p/m³ at other times.
- And yet we have seen increasing leakage due to severe cold weather cause problems in Northern Ireland with depleted service reservoirs.
- Wouldn't rising block tariffs send a more consistent message about the importance of saving water?

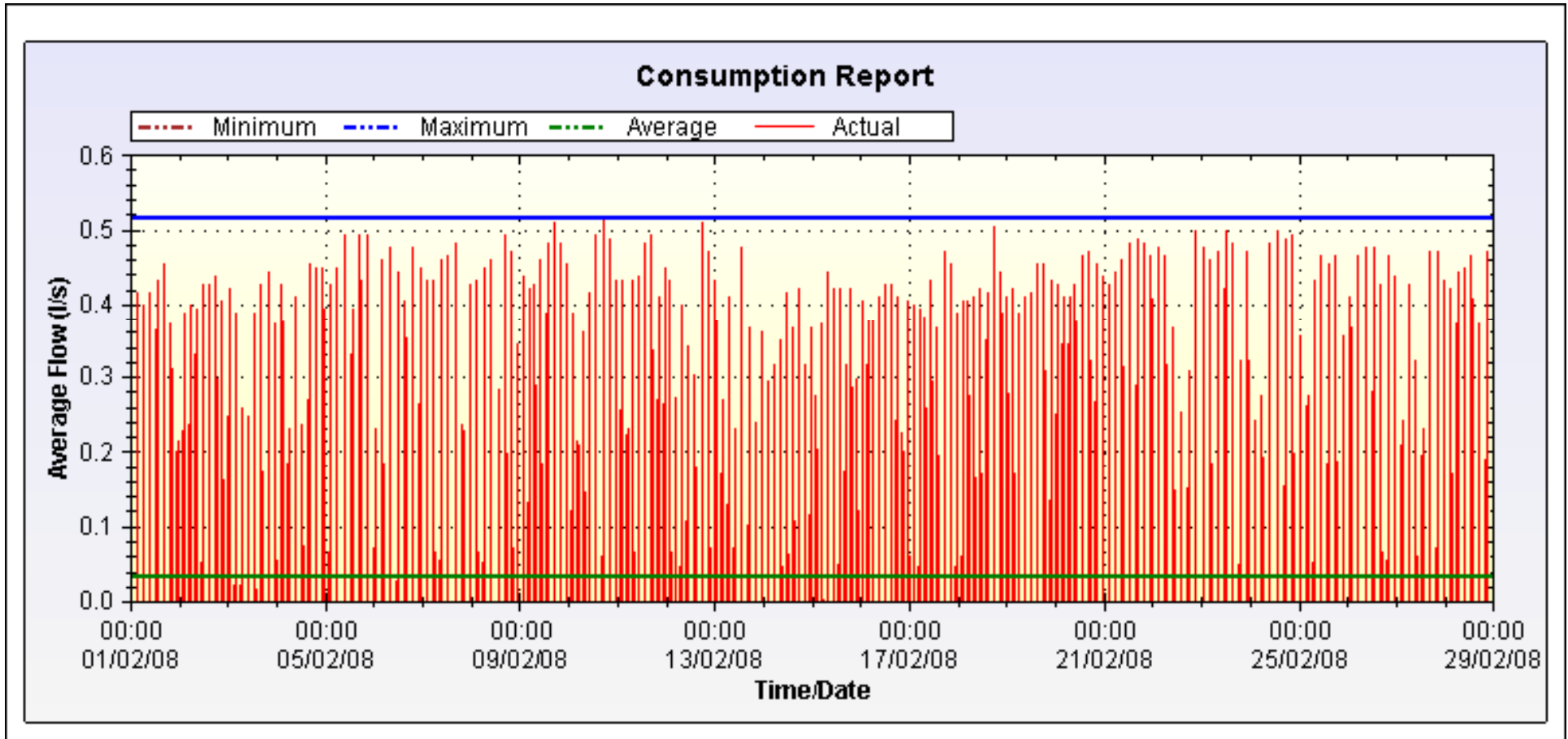


**To effectively change behaviour we
require more understanding of
current water use within buildings**

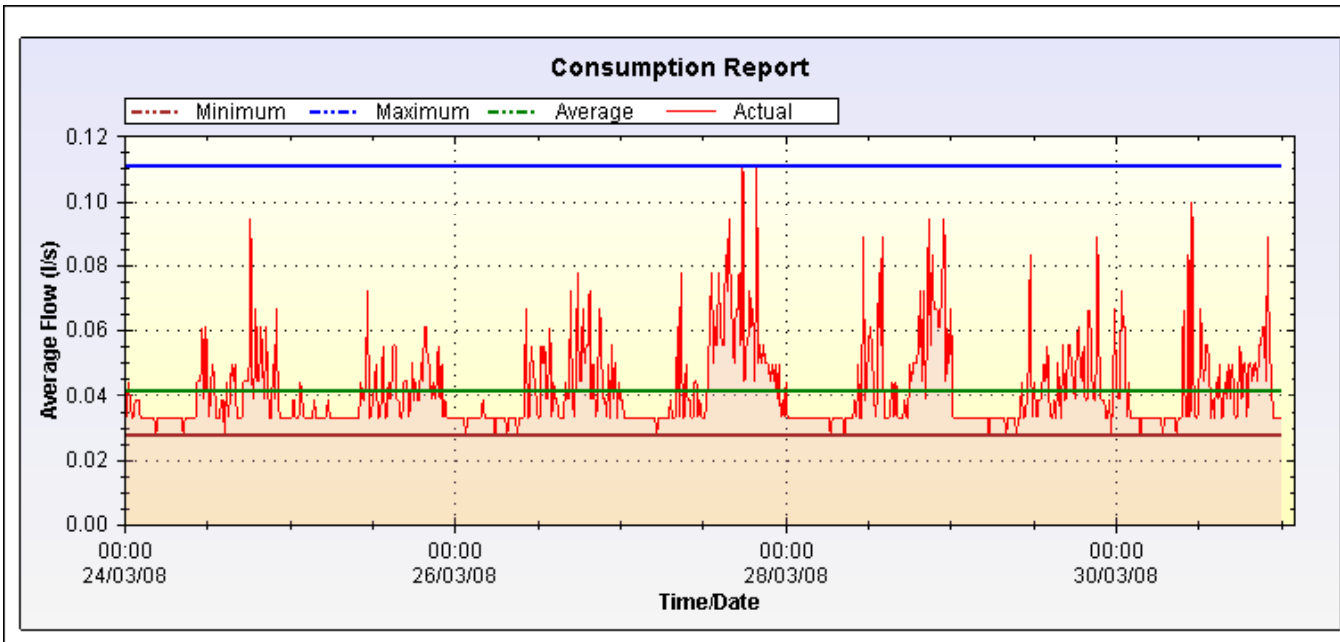
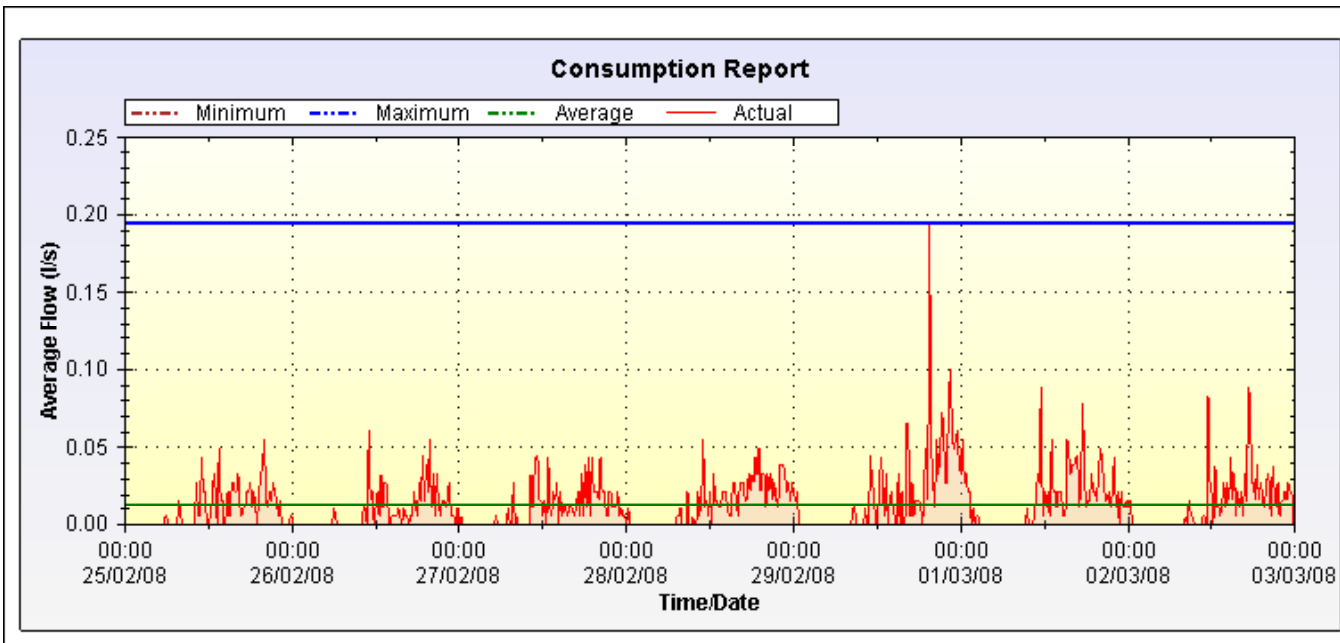
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In February 2008 this nightclub, which was closed, used 91m³ of water. (Used 160 m³ when open).



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This pub was wasting 20m³ of water a week after the urinal controls were removed



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Solutions from ech₂o

- Identification of best water efficiency solutions and Code solutions
- Feasibility studies and design guidance for rainwater or greywater (new build or retrofit)
- Identification of most effective SUDS solutions for existing buildings including green roofs
- Water audits of existing buildings, residential and commercial
- Workshops with building occupiers to reduce their water and carbon footprint





ech₂o consultants ltd work with a range of stakeholders to successfully incorporate sustainable water and low carbon solutions into the built environment.



www.ech2o.co.uk



The South East is Under Water Stress

A glass of beer with a cracked, dried-out appearance, symbolizing water scarcity.

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